

O C C U P A T I O N A L

# Health & Safety

M A G A Z I N E

## Hydrocarbons on the loose

Chemical  
Confusion

The Invisible  
Injury



# Yes, You Can Reduce Musculoskeletal Injuries at Your Company

by Brian Halina

**A**s an owner of an electrical contracting company, I have always been concerned about workplace injuries. The construction industry has an aging workforce, the work is physically demanding and tasks are often very repetitive. Consistent procedures, safe work practices and personal protective equipment help, but they don't always prevent the repetitive strain injuries that are so common in our work... and elsewhere. Over the last ten years, strains have consistently accounted for over 40 per cent of the costs incurred by WCB.

Another challenge we face in construction is our mobile workforce. For the most part, work is not performed at specific workstations, so ergonomic redesign of places where people work is not always an option.

In construction, short-term employment presents another safety challenge. Although some workers stay with one company for many years, a significant number may work for a company for only a few weeks. Still, the duration of employment should not be a factor in the efforts we make to prevent injuries. Employers are doing the right thing in providing employees with safety knowledge they can use on the work site, at home or as a resource they take with them to a new job.

## Stretching for safety

In 1998, my company, Chemco Electrical Contractors Ltd., worked with other partners at the Dow Chemical site to set up a pilot program designed to reduce all injuries, including strains. A survey of employees on the site indicated that their concerns about reducing injuries were the same as those of management. The introduction of a stretching program was agreed upon.

Within a few months of launching the pilot program, and prior to being able to evaluate the results, we introduced the pilot program to another site, AT Plastics, as they were experiencing a large number of strains. Most strains occurred while workers were pulling electrical cables. This repetitive task can be very physically demanding because of the size and weight of the material being installed and the position of the workers' bodies while performing the task.

The Dow Chemical site recorded a 75 per cent reduction in strains, while the AT Plastics site reported a 50 per cent reduction. At the AT Plastics site, the cable crews alone reported a 100 per cent reduction. In this pilot project, which involved approximately 400 Chemco employees, we not only saw a definite decrease in strains reported but also had very positive feedback from employees.

In addition to stretching activities, the program educated employees about incorporating stretches into the performance of a task. This is beneficial for tasks that

require stationary positioning for longer periods of time, as well as for tasks that are repetitive. In both cases, workers take short breaks while performing their tasks and stretch the muscles they are working with.

Our efforts did not go unnoticed by our peers in the industry. Chemco received the Syncrude Contractor Recognition Award for Environment Health and Safety for the most innovative environmental health and safety idea implemented. And we were selected as one of the three finalists for the Workers' Compensation Board 2000 Worksafe Award of Distinction. These tributes have acknowledged our employees' commitment to creating a safer work culture, not only for themselves but for their fellow workers, now and in the future.

I have concluded that similar programs are needed on all our job sites. The stretching program has had definite short-term benefits in reducing the number and severity of injuries. However, the potential for long-term benefits is immense as well. Many musculoskeletal injuries are the result of years of repeated activities that place stress on different parts of the body. One of our more experienced workers put it well, "Where was this program 20 years ago when I started in the trade?" he asked.

I see employees as the most valuable resource an organization has. We must do what we can to preserve this resource.

If we want to make an impact on musculoskeletal injuries, we have to be willing to take different approaches. A workplace without injuries is possible.

*Brian Halina is the president of Chemco Electrical Contractors Ltd.*



OCCUPATIONAL  
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Calgary	(403) 297-2222
Edmonton	(780) 427-8848
Grande Prairie	(780) 538-5249
Lethbridge	(403) 381-5522
Medicine Hat	(403) 529-3520
Peace River	(780) 624-6162
Red Deer	(403) 340-5170

or visit the Alberta Human Resources and Employment Web site: [www.gov.ab.ca/rre](http://www.gov.ab.ca/rre)

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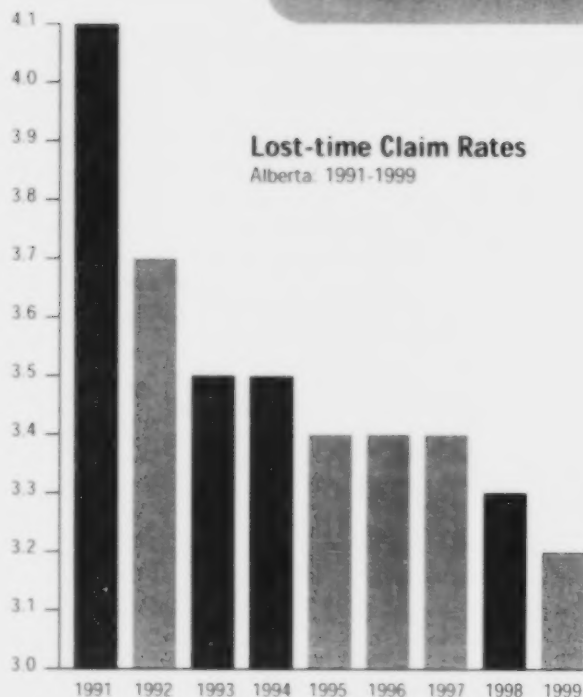
## 1999 lost-time claim rate declines

The Alberta lost-time claim rate continued its decline in 1999, decreasing three per cent from 1998. Now standing at 3.2 per 100 person-years worked, the rate is the lowest ever recorded in the province and translates to about 16 injuries and illnesses per million hours worked. Data used to calculate the rate are lost-time claims accepted by the Workers' Compensation Board - Alberta (WCB). About two-thirds of those employed in Alberta have WCB coverage. Exceptions include some agricultural, financial services and federally regulated workers.

The rate of young workers getting hurt on the job last year continued high. Alberta Human Resources and Employment's *Occupational Injuries and Diseases in Alberta, 1999 Summary*, points out that "the situation is particularly more alarming for young male workers, who are 85 per cent more likely to be injured than other workers." The manufacturing and processing, retail and wholesale trade, and construction industries accounted for over 65 per cent of lost-time claims among young workers.

While the lost-time claim rate for small business (those with fewer than 40 full-time employees) was about the same as the provincial rate, it was about seven per cent higher than those with more than 40 full-time employees.

Occupational fatalities accepted by the WCB totalled 114. Of these, 33 per cent were incidents of occupational



disease, 38 per cent were workplace incidents and 29 per cent were motor vehicle incidents.

Sprains, strains and tears continued to be the most common type of lost-time injury, with the back the most commonly injured body part.

For more information, see *Occupational Injuries and Diseases in Alberta, 1999 Summary*, available at [www.gov.ab.ca/hre](http://www.gov.ab.ca/hre) or (780) 427-8531.

## Calling First Aid Trainers

Is training your business? Training agencies interested in delivering first aid courses in accordance with Alberta's new *First Aid Regulation* are invited to submit applications to Workplace Health and Safety for review.

Approved training agencies agree to a mandatory review of the course and training materials. Course curriculum is determined by Workplace Health and Safety's director of medical services in consultation with a first aid standards board. Training standards and submission requirements are set out in the quality management plan found at [www.gov.ab.ca/lab/regs/faapp.html](http://www.gov.ab.ca/lab/regs/faapp.html).

### Send submissions to:

Director of Medical Services  
9th Floor, 10808 - 99 Ave.  
Edmonton, AB T5K 0G5

Employers may continue using training agencies approved under the old regulation until December 31, 2000 - an extension of the original August 31, 2000 deadline.

For additional information, call (780) 415-8408.

## What works for you?

**D**o you run a small business? And have you found creative ways of improving health and safety at your workplace? Tell us your story and we'll pass it along to our readers. We want to hear about your practices, methods, equipment modifications and management concepts – anything that's provided you with a solution to a health and safety issue. Here's your chance to make a difference to health and safety at work sites across the province – urban or rural, office or oil lease.

Send your story to  
[eric.reitsma@gov.ab.ca](mailto:eric.reitsma@gov.ab.ca)

## Health and safety for youth

**A**lberta will be sponsoring ten young workers to attend a Youth Health and Safety in the Workplace conference in Ottawa this fall. The conference, scheduled from October 15 through October 18, will bring together representatives from unions, management, not-for-profit organizations, government and academia, along with young workers, to address the serious issue of the disproportionately high rates of injury to young workers. For more information, contact Robert Feagan at (780) 415-0608.

## Protect those who work alone

**L**ike employees in any hazardous workplace situation, those who work alone need to know how to protect themselves and what support they can expect from their supervisors and employers. To ensure the safety of these workers, the Alberta government is preparing a regulation to address the hazardous nature of working alone. The proposed regulation, based on recommendations of a government-industry-labour committee, will identify employer and employee responsibilities in situations where people work alone. When the regulation is passed, an information handbook for employers and employees will be made available to the public.

## OHS Regulatory Review Update

More regulations coming your way . . .

**T**he ongoing Workplace Health and Safety (WHS) regulation review will be completed by December 2000. Representatives from industry, government and labour organizations are reviewing regulations governing explosives, noise, chemical hazards, mine safety, radiation and ventilation, and the *General Safety Regulation*. The new regulations will come into effect by the spring of 2001.

A task force set up for each regulation reviews identified issues and drafts proposals for a revised regulation. Drafts are made available for stakeholder and public scrutiny and comment. All comments received are considered before a draft is finalized.

Discussion papers and proposals for the regulations mentioned below are posted for review and comment on the WHS Web site: [www.gov.ab.ca/lab/new/review](http://www.gov.ab.ca/lab/new/review).

For more information, call (780) 427-2687.

- **General Safety Regulation, including provisions for fall protection for roofers**

- **Chemical Hazards Regulation**

The draft proposals have been completed and stakeholder comments are now being reviewed.

- **Mines Safety Regulation**

- **Alberta Joint Work Site Health and Safety Committee (JWSHSC) Regulation**

The regulatory review is underway. A discussion paper has been released to employer and labour groups. Stakeholder comments are being reviewed before the regulatory proposal is drafted.

- **Explosives Safety Regulation**

- **Ventilation Regulation**

- **Noise Regulation**

The public consultations have been completed.

- **Radiation Health Administration Regulation**  
(under the *Government Organization Act*)

The initial review phase is complete and a draft proposal has been completed and released to stakeholders for review.

- **Safety Requirements for Electric and Communication Utility Workers**

(a new component of the *General Safety Regulation*)

The draft proposal is available for public consultation.



# Chemical Confusion

by Bill Corbett

**W**hat's the difference between buying solvent in a 170-litre drum from an industrial wholesaler or in a one-litre can from a local hardware store? A whole lot of safety information.

The 170-litre drum falls under federal legislation that requires the supplier to provide detailed labelling and Material Safety Data Sheets (MSDS). By contrast, the one-litre can is considered a consumer product. Therefore, its sole safety instructions might be a centimetre of fine print and a hazard symbol.

Solvents are just one of many potentially hazardous "consumer chemicals" that for various reasons are treated differently, from a safety information perspective, than industrial versions of the same products. Yet a surprising number of these consumer and other chemicals can find their way into the workplace. A company employee, for example, might head to a nearby retail store to pick up a can of paint for touching up the shop walls, a bag of cement for fixing a crack in the concrete, a bottle of ammonia for washing the staff kitchen floor or a jug of herbicide for spraying dandelions on the company lawn. Because such consumer chemicals contain agents that have the potential to cause everything from skin irritation to cancer, it is important that employers and employees be aware of their hazards and treat them like any industrial chemical.

"It's a perception issue," says Diane Radnoff, senior occupational hygienist and provincial Workplace Hazardous Materials Information System (WHMIS) coordinator with Workplace Health and Safety. "People think, 'If I can buy it at a local hardware store and take it home or bring it into the workplace, it's not as harmful as the chemicals purchased from industrial suppliers.' Regardless of where the chemical comes from, it can be equally hazardous to the user."

## A two-tier labelling system

The rationale behind the discrepancy in hazard information is that industrial chemicals commonly used in the workplace pose a greater health risk than their consumer counterparts. "The difference addresses the fact that workers are often exposed for a greater length of time, such as using methanol throughout an eight- or 12-hour shift. Most consumer products are not used to this extent, are usually more diluted and are used in smaller volumes," says Paul

**People think, 'If I can buy it at a local hardware store and take it home or bring it into the workplace, it's not as harmful as the chemicals purchased from industrial suppliers.'**

Chowhan, a project officer in Ottawa with the Product Safety Bureau of Health Canada. "If you're using chemicals on a day-to-day basis, it is necessary that workers receive adequate training. A WHMIS-type training system for consumer products would not be feasible."

But Radnoff disagrees with the two-tier system. "Many of these products use the same formulation," she says. "If you're painting your house, you might use the same quantities of paint and thinner as an industrial worker would."

The inconsistencies in information required for various classes of chemicals can also pose problems for the user. Indeed, figuring out which products are covered by federal legislation and subject to WHMIS information requirements and which fall under other regulations with different requirements can be as confusing as the chemistry behind the products.

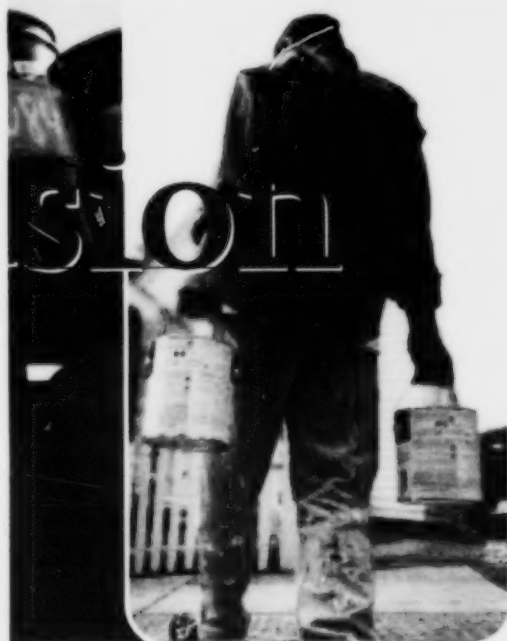


The classification of a product is often a complex process. A "controlled product" is subject to WHMIS's information requirements. A "restricted product" for consumer consumption in smaller quantities is exempt from WHMIS rules for labelling and MSDS. Examples of exempt products packaged for retail sale include bleaches and cleansers containing chlorines, corrosive chemicals such as hydrochloric acid, and turpentine.

A number of other products containing the same chemicals can enter the workplace with exemption from WHMIS requirements because they are covered under legislation other than the federal *Hazardous Products Act* (HPA). Cosmetics, for example, come under the *Food and Drug Act*, and pesticides under the *Pest Control Products Act*. Each law has its own health and safety information requirements. As a result, acetone is excluded from HPA requirements when sold in a nail polish remover but included when used in an industrial solvent. Similarly, Stoddard solvent can be found in both an excluded herbicide and an included industrial solvent. To further confuse the issue, products that exempt the supplier from providing WHMIS labelling and MSDS do not exempt employers from providing employee training programs because this matter comes under provincial legislation.

## Need recognized for greater regulatory consistency

"Often, workers face a hodgepodge of information," says Radnoff. "If the product is considered a controlled



product, label and MSDS content must comply with the requirements set out in the controlled products regulations. But if it's a pesticide or a consumer product, it's covered under different legislation and there's no requirement for the supplier to provide an MSDS for the product."

The federal government is reviewing some of this legislation to bring greater consistency to the regulation of hazardous chemicals. For instance, consumer chemical and container regulations are moving to more of a WHMIS-style, criteria-based classification system, which will focus more on the hazard of the total product rather than on its individual components.

**If you're using chemicals on a day-to-day basis, it is necessary that workers receive adequate training.**

Employers can do several things to lessen the risks related to consumer and other non-controlled products that enter their workplace. First, they can request manufacturers or suppliers of such products to provide them with MSDS. "Most suppliers are very good about providing information about products," says Radnoff.

Employers can also provide their own warnings for chemicals exempt from WHMIS rules. "There's nothing to stop employers from creating their own labels to put on top," says Chowhan. "They can educate their people on the proper use of these chemicals." In fact, this is a requirement under Alberta's *Chemical Hazards Regulation*.

The simplest solution, suggests Radnoff, is not allowing any chemicals exempt from WHMIS labelling or MSDS requirements onto the work site. "If you can avoid bringing these things in, you should. But it's hard to control. If these products are used or stored at the work site, it's the employer's responsibility to obtain the information required for their safe use and handling, and to train the workers at their work site appropriately."

Bill Corbett is a Calgary writer.

#### RESOURCES

##### WEB LINKS

[www.hc-sc.gc.ca/hpb/transitn/index.html](http://www.hc-sc.gc.ca/hpb/transitn/index.html)  
Facts from Health Canada

[canada.justice.gc.ca/STABLE/EN/Laws/Chap/H/H-3.html](http://canada.justice.gc.ca/STABLE/EN/Laws/Chap/H/H-3.html)

Canada's Hazardous Products Act

[canada.justice.gc.ca/STABLE/EN/Laws/Chap/F/F-27.html](http://canada.justice.gc.ca/STABLE/EN/Laws/Chap/F/F-27.html)

Canada's Food and Drug Act

[www.hc-sc.gc.ca/ehp/ehd/who/psb.htm](http://www.hc-sc.gc.ca/ehp/ehd/who/psb.htm)  
Health Canada's product safety information

[www.ohsu.edu/croet/links.html](http://www.ohsu.edu/croet/links.html)

The Center for Research on Occupational and Environmental Toxicology links to a variety of occupational health subjects and resources

##### IN THE ALBERTA HUMAN RESOURCES AND EMPLOYMENT LIBRARY

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 57  
Lyon, France: IARC, 1993  
(RC 268 57 In8 v. 57 1993)

*Occupational exposures of hairdressers and barbers, personal use of hair colourants, some hair dyes, cosmetic colourants and industrial dyestuffs*

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 63  
Lyon, France: IARC, 1995  
(RC 268 57 v. 63 1995)

*Dry cleaning and some chlorinated solvents, and other industrial chemicals*

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 65  
Lyon, France: IARC, 1996  
(RC 268 57 In8 v. 65 1996)

*Printing processes and printing inks*

## Farm Chemicals

Alberta farmers are largely exempt from the rules of the Workplace Hazardous Materials Information System (WHMIS). As a result, many workers on the province's 60,000 farms are unaware of the proper way to handle potentially toxic chemicals.

"Most farmers are familiar with the hazards of pesticides because they use them so much," notes Eric Jones, senior farm safety specialist with Alberta Agriculture, Food and Rural Development (AAFRD). Still, in a lot of cases they don't protect themselves properly. "My major concern," says Jones, "is with all the other chemicals used on farms, like Varsol and petroleum products. In an industrial setting, these products would be covered under WHMIS. Some farmers still wash their hands in gasoline. When I tell them it's carcinogenic, they say it's okay because they wash in unleaded gas."

"A lot of farm chemicals are also not stored properly. Dairy operations use large quantities of ammonia and other cleaning agents to wash their equipment. You'll often find these chemicals just piled together in a corner. Some farmers buy paints and pesticides on special and then store them for the winter in the basement of the house. These chemicals can permeate through metal containers and get into the ventilation system."

Jones says some progress is being made. He is working with Alberta feedlot operators to develop safer chemical handling practices and to provide WHMIS training for their employees. He convinced one feedlot to switch its indoor heaters from kerosene — which can affect the nervous system — to natural gas. "Younger farmers know they have to protect themselves better or they could die like some of their fathers did," says Jones, whose uncle died of lip cancer in his 50s.

For more information on safe handling of agricultural chemicals, contact AAFRD's Farm Safety Program at (780) 427-2171 or see [www.agric.gov.ab.ca](http://www.agric.gov.ab.ca)



# Hydrocarbo

by Verleen Barry

**A lack of hydrocarbon awareness, training and hazard detection methods has caused too many tragic incidents.**

## Government takes action

Because of the number of fires occurring on lease sites, Workplace Health and Safety (WHS) is working with industry to improve awareness of hydrocarbon hazards. The WHS oil and gas program, launched in July 1999, is geared toward the drilling and servicing industry. If an on-site WHS inspection reveals a high hazard of uncontrolled and unmonitored release of hydrocarbons, the site will be shut down and a stop-work order issued until the condition is corrected.

**Y**our son is a smart, responsible young man with his future before him. To earn money to attend university in the fall, he has taken a summer job as a labourer for a gas company, working on a drilling site.

Then, in a fraction of a second, his life and yours are changed forever. In a workplace fire caused by hydrocarbons in the atmosphere, your son sustains third-degree burns to 85 per cent of his body. He is taken to hospital and the doctor tells you that his chances of survival are slim.

A thousand questions run through your mind, all with no answers. "Why my son? How did he get into a hazardous area? What measures were taken to alert workers to the hazards?"

Although this story sounds dramatic, all too often it is a sad reality for workers and their families.

## Detecting and controlling hydrocarbons

Under certain circumstances, hydrocarbons, such as methane, butane or propane, become flammable (see sidebar, "Hydrocarbons"). Hydrocarbons are a major hazard on oil and gas industry work sites because the vapours hide in confined spaces, pool in low-lying areas or become airborne when sludge is disturbed and disperse into the atmosphere.

With the technology and information available today, allowing these hazardous situations to exist is unacceptable. Therefore, Alberta's *General Safety Regulation* requires employers to evaluate "the potential for creating an explosive atmosphere" when storing, handling or processing flammable substances. If such an evaluation determines that hydrocar-



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## on the loose

bons may be released into the atmosphere and present a risk of a flash fire or explosion, the employer is required to develop appropriate procedures and precautionary measures. In other words, workers have to be competent to address hydrocarbon hazards safely.

Employers might choose to use engineering controls; for example, routing hydrocarbons to a closed system such as a pressure vessel or flare. A pressure vessel removes the liquids and solids and routes the gas to a flare where the hydrocarbons are safely burned. Alternatively, if a small amount of hydrocarbon is released (for example, when draining a pump) employers could remove workers and all ignition sources from the area while the hydrocarbons are released (an administrative control). Installing a hydrocarbon gas detector (an equipment control) is another option. Hydrocarbon detection is an effective means of ensuring the work area is free of hydrocarbons, as you can't rely on smell, visible vapours or atmospheric conditions such as wind to detect or control the gases.

### Hydrocarbons as hazardous as H<sub>2</sub>S

Most workers are well aware of the dangers of hydrogen sulfide (H<sub>2</sub>S) and can use detection and personal protective equipment to address them effectively. Unfortunately, however, when working on wells that do not contain H<sub>2</sub>S (sweet wells), workers tend to become complacent and develop a false sense of security. The belief that sweet wells are not as dangerous as sour wells has to be dispelled.

Following are just a few examples of incidents that occurred at sweet wells in 1999. In some cases, the injuries were minor, but there was clearly potential for serious injuries or fatalities.

- A water truck pulled up to a rig tank while the well was circulating (pumping fluid into the well). The truck engine ignited hydrocarbons coming off the tank as the fluid flowed back up the well. Two workers received burns to the hands and face.
- Workers used a torch to thaw a pipe on a production tank. They left the torch burning while they removed ice from the valve on the tank. Hydrocarbons escaped from the tank and ignited, burning one worker's hands and face.

## Hydrocarbons

**Fires and explosions** in the oil and gas industry are often caused by hydrocarbon vapours. A combination of hydrocarbon vapour and oxygen contacting an ignition source can cause a fire or explosion.

**Hydrocarbons** (such as methane, butane or propane) are compounds of hydrogen and carbon atoms. Processes used in the oil and gas industry can release vapours into the atmosphere.

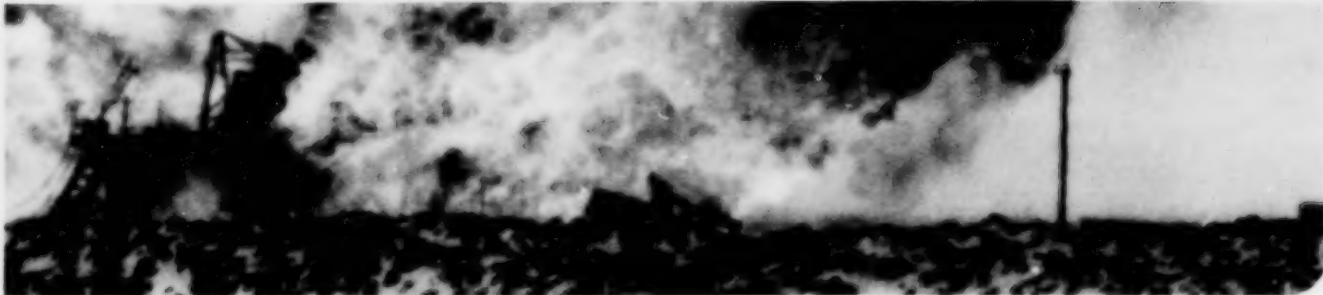
**So-called sweet wells** produce hazardous vapours. Sour wells produce hydrogen sulphide (H<sub>2</sub>S), which not only is toxic but also is highly flammable. Methane, like H<sub>2</sub>S, mixes with air, becoming extremely flammable.

**To prevent fires or explosions** at oil or gas drilling, servicing or processing sites, know the flammable or explosive limits of hydrocarbons and monitor the atmosphere for their presence. Hydrocarbons are explosive within the range defined by these limits. A limit is the percentage of hydrocarbon, by volume, in the air-hydrocarbon mixture. For example, when exposed to air, methane has a lower explosive limit (L.E.L.) of 5.0% and an upper explosive limit (U.E.L.) of 15.0%. Any air and hydrocarbon mixture in this range will burn or explode.

**Sources of ignition in a workplace include (but are not limited to):**

- welding
- cutting
- friction
- internal combustion engines
- sparks from faulty electrical systems
- cigarettes
- lightning
- auto-ignition
- pyrophoric iron sulphide
- spent catalyst

When dealing with mixtures of hydrocarbons, such as a combination of methane, propane and butane, handle them according to the properties of the most hazardous component, in this case, butane. When mixed with air, butane has an L.E.L. of 1.9% and an U.E.L. of 8.5%. Butane will combust when its percentage within the hydrocarbon compound falls within the L.E.L. and U.E.L. and is in a vaporized state.



## Hydrocarbon safety checklist for employers

- Engineering, administrative and personal protective equipment controls
- Adequate safety training programs
- Adequate supervision
- Hazard assessment
- Pre-job meetings
- Up-to-date, standard operating procedures
- Orientation for new workers to company safety policy and procedures
- Properly maintained and calibrated hydrocarbon detection equipment
- Established lockout and isolation, hot-work and confined-space entry procedures

## Steps to prevent hydrocarbon-related incidents

### Employers must:

- **Train workers.** Include orientation to the company's safety policy and information about safe working procedures. Ensure that workers know about the hazards they are likely to encounter during a job and how to handle those hazards.
- **Conduct a hazard assessment on the job to be done.** Hold a pre-job meeting and inform workers of the potential hazards.
- **Ensure that a job involving hot work has been properly prepared.** Has the area been ventilated, purged, isolated, blinded and gas-checked before the job is started? Shut down or control all sources of ignition (for example, engines or smoking materials). Ensure that the gas detector is properly maintained and calibrated, and that workers using this equipment are trained and competent.
- **Ensure that workers comply with the Occupational Health and Safety Act and its regulations as well as the company's own safety policies.** Supervisors on the site must be knowledgeable about proper procedures for the job or task. With increased activity on lease sites, we are seeing younger, less experienced crews. Comprehensive training of these workers is critical. Supervisors must ensure that all workers are trained to react appropriately in hazardous situations.

- A vacuum truck hooked on to a vessel containing propane and pulled air into the vessel. The air mixed with the propane, creating an explosive atmosphere in the vessel. The resulting explosion blew open the door on the vessel and burned four workers on the hands and face.
- Workers were welding a vent on a truck that had hauled water pumped out of a production well. The residue of the produced water emitted hydrocarbons that exploded when the welding started. Two workers were killed in the explosion.

**The belief that sweet wells are not as dangerous as sour wells has to be dispelled.**

Investigation of the incidents revealed these causes:

- Workers were not trained to an appropriate level of competence.
- The workers didn't know about the hazards of the job or safe procedures.
- Supervision was inadequate.
- A supervisor asked workers to perform a task that put them in a dangerous situation.
- Hydrocarbon detection methods were not used.

A lack of hydrocarbon awareness, training and detection methods has caused too many tragic incidents, and it's time to take action.

(For details of the legislation pertaining to hydrocarbon hazards, refer to the *General Safety Regulation*, sections 178 and 179.)

*Verleen Barry is an occupational health and safety officer with Workplace Health and Safety (WHIS). She is the northern regional coordinator of the WHIS oil and gas program.*

### Resources

#### WEB LINKS

[hazard.com/msds/index.html](http://hazard.com/msds/index.html)

The University of Vermont's SIRI (Safety Information Resources Inc.) MSDS collection. Search for "hydrocarbon" or "hydrocarbons."

[www.dupont.com/safety/esn98-1/oil-gas.html](http://www.dupont.com/safety/esn98-1/oil-gas.html)  
Safety information from DuPont.

# Leading safety in residential construction

by Norma Ramage

It's obvious to anyone who has ever watched a home being built that there are dozens of potential safety hazards in the work. While there are no provincial regulations requiring any construction company to employ a full-time safety officer, the owner of Calgary's Homes by Avi hopes to set a trend for just that.

Avi Amir would like to walk on to any building site in Alberta and see every tradesperson working safely. "Safety is an important part of our business," says Amir, "and I take it very seriously."

Earlier this year, Homes by Avi became the first residential homebuilder in Alberta to employ a full-time safety officer. This person's job is to visit the sites of the 300-plus homes the company builds each year in Calgary and Edmonton to ensure compliance with provincial safety regulations. If any tradespeople are in violation, says Amir, "we call the subcontractors and tell them they must fix the problem. People will risk their positions with us if they ignore our safety officer and tell him to go away."

Grant Ainsley, executive director of the Alberta Home Builders' Association, says the more usual approach of the province's residential builders is to make safety the part-time responsibility of a construction manager, superintendent or other employee. Inspectors with Workplace Health and Safety also conduct site compliance checks. So why is Homes by Avi the first residential builder to appoint a safety officer? The monetary paybacks such as reduced Workers' Compensation Board - Alberta (WCB) payments are less substantial for residential builders with small numbers of employees than for the larger commercial builders, says Ainsley. Most residential builders require their subcontractors to carry their own WCB coverage. At Homes by Avi, subcontractors make up 90 per cent of the workforce.

Amir says he didn't consider potential reductions in WCB costs when he instituted the program. "It would be false to say that we're doing this because somebody will give us money at the end of the day," he states. "We're doing it because we should, and because it improves the way we do business."

Amir agrees, on the other hand, that establishing a reputation as a safe workplace will likely help his company attract and keep top people, even in today's overheated construction industry.

Having a reputation for safety is good public relations, Amir says with a smile. "Overall, if we can establish ourselves as a safe company, it will be one more push for Homes by Avi in the marketplace. Good people will want to work for us and families will want us to build their homes."

Before the appointment of a full-time safety officer, safety practices at Homes by Avi were less formal. The focus was primarily on safety discussions at weekly construction



meetings. Late last year, the company decided to formalize its safety practices in a manual. However, Amir says now, it became clear that "unless we were really forceful we couldn't get people to follow the manual. We felt we couldn't be forceful enough unless we had somebody devoted to safety full time."

Fortunately, Amir had the right person available in DeVere Viola, an eight-year veteran construction manager with the company. As safety officer, Viola visits each Avi site every week to ensure compliance with the *Occupational Health and Safety Act*. He also undertakes occasional special projects such as this year's Calgary Stampede show home.

**We're doing it because we should, and because it improves the way we do business.**

Viola admits that enforcement is "tough," partly because his job is very new. "Down the road, once we get this program implemented, I think it will be a plus for the company," Viola says he has already received "really good feedback" from homeowners.

For now, Viola keeps on persuading and negotiating where he can, and getting tough when he has to. If employees and subcontractors ignore his suggestions, he reports the matter directly to his operations manager or to Amir. "Avi wants us to go at this 100 per cent," he says.

Ray Cornez, team leader with Workplace Health and Safety in Calgary, says one plus of an in-house safety officer like Viola is his hands-on experience with the residential building industry. "Our inspectors cover all industries. We can't be experts in any one area. A company safety officer who knows the business also knows the problems people can encounter on the job."

Amir thinks that once his competition knows what his company is doing, the larger builders will follow his example. He says the costs are minimal, and there's great personal and professional satisfaction in running a safe company.

*Norma Ramage is a freelance writer and communications consultant living in Calgary.*

# The Invisible Injury

by Anne Georg

**A**ssembly line workers on the Cargill Foods production floor do a lot of laborious and heavy work. On the slaughter floor and fabrication floor, workers handle animal carcasses and cut them up into a variety of marketable cuts. The tools they use are knives and hooks.

Because of the repetitive and physical nature of their jobs, the slaughter and fabrication floor workers represented an unusually high percentage of injuries in the company. From 1996 to 1998, carpal tunnel syndrome and trigger finger (see "Definitions" page 13) were responsible for 46 surgeries among Cargill's 1,735 production workers. Cargill recognized the impact these surgeries were having on productivity. The company entered into an innovative seven-year-long research program involving the University of Calgary Faculty of Medicine, an occupational therapist and a full-time research assistant who is still working at Cargill. Their research determined that trigger finger in the meat industry in Alberta costs approximately \$6.63 million annually.

As a result of that research, two sizes of hooks were designed to accommodate varying hand sizes. The tool was also redesigned to reduce pressure on the wrist.

Other ergonomic practices were instituted as well, including:

- an extensive database that is used to analyze common injuries
- new hiring practices that match a potential employee with appropriate tasks
- training to emphasize employee alertness and individual responsibility for minimizing risk on the job

"In 1999 no surgeries were required, and in 2000 only two surgeries can be attributed to repetitive strain injuries," reports Kev Auty, safety manager at Cargill's High River plant. These improved musculoskeletal injury (MSI) statistics clearly show the value of the changes made.

Cargill is bucking the trend. Experts agree that incidents of MSI are on the rise. "MSIs are becoming more common as the workforce ages," says Linda Martin, ergonomic consultant with Ergo Works Inc. in Edmonton. "Workers are not as able to endure repetitive strain on the job and do not recover fully from injuries."

"Even though industry thought mechanization would reduce the workload," says Martin, "increased automation may often require the individual to perform more repetitive motions." Martin uses assembly-line workers who package tissue as an example. These workers traditionally performed four or five tasks. "With increased mechanization, workers do



only one task and at a much faster rate," she explains.

Martin estimates that workers who package tissue repeat a six-to-seven-second task cycle for eight hours a day. There may be two to three stressful wrist motions per cycle. In one minute, the worker performs 20 to 30 stressful wrist actions. That translates to 1,200 to 1,800 stressful wrist actions per hour.

Workplace Health and Safety reports that in 1999 MSIs involving the back, upper limbs, wrists and hands accounted for 29.5 per cent of all lost-time claims. Overexertion injuries were almost twice as great as the next injury category.

To reduce the current high level of MSIs, Workplace Health and Safety advises employers to redesign workstations, reduce the awkward body positions that workers adopt to perform their work, and reduce or eliminate repetitive movements. Many of these changes cost little or nothing to implement, and they prevent the substantial costs resulting from time lost due to injury.

**Many companies see the value of adapting the workplace to the workers, recognizing that the best solutions for preventing MSIs come from the workers themselves.**

Injury is often the result of a mismatch between the demands of the work tasks and the worker's ability to meet those demands. A worker may be physically overloaded by the necessity of repeating one motion thousands of times during a shift.

Many companies see the value of adapting the workplace to the workers, recognizing that the best solutions for preventing MSIs come from the workers themselves. Companies are redesigning workstations and tools to reduce awkward repetitive motions. They are training workers to use the proper posture for the task, identifying repetitive stresses, rotating tasks so workers are not doing the same task all day and encouraging workers to take frequent breaks.

The Goodyear Tire assembly plant in Medicine Hat uses a training process called Objective Base Training (OBT) to ensure that its workers minimize the risk of MSIs. This process involves analyzing each task and categorizing it by physical movements. Workers (called "associates" at Goodyear) go through the OBT with a trainer. They discuss what the job entails and how to do it safely. An accompanying OBT manual outlines specific key safety points that help both new and experienced associates do their jobs safely.

Associates are certified within two to three weeks of starting their new job, and re-certified every year. As a result, they understand the essential job functions as well as the importance of safety. Starting in September, associates will be trained in ergonomic awareness and how to prevent incidents that involve ergonomics.

"The OBT includes quick stretches that help prevent repetitive strain injuries. Associates are in the beginning stages of using these stretches during the workday," says Craig Hiebert, the health and safety manager at Goodyear Tire in Medicine Hat.

Both Goodyear and Cargill have recognized the importance of preventing MSIs on their assembly lines. Prevention programs like the ones these companies have implemented are meaningful steps toward countering the trend toward increased incidents of MSI.

"MSIs don't kill workers, but they can have a devastating impact on their lives and their livelihood," says Ray Cislo, safety engineering specialist at Workplace Health and Safety. "A worker in pain can't

concentrate. The quality and productivity of their work decreases. A worker with damaged nerves may become clumsy. Those things affect the company's bottom line, and they're taken home to the worker's family. MSIs are a serious problem."

*Anne Georg is a writer and communications consultant who works from her home base in Calgary.*

## Resources

### WEB LINKS

[www.med.virginia.edu/medicine/clinical/orthopaedics/admusc.html](http://www.med.virginia.edu/medicine/clinical/orthopaedics/admusc.html)

Describes various musculoskeletal disorders.

[www.discoveryhealth.com](http://www.discoveryhealth.com)

Look up health@work. The site includes a desk exercise of the day for relief from musculoskeletal strains and stresses.

[www.cdc.gov/niosh/93-101.html](http://www.cdc.gov/niosh/93-101.html)

National Institute for Occupational Safety and Health's (NIOSH) national strategy for occupational musculoskeletal injuries.

[www.ergoweb.com/](http://www.ergoweb.com/)

Comprehensive ergonomic information.

### IN THE ALBERTA HUMAN RESOURCES AND EMPLOYMENT LIBRARY

#### Books

**Musculoskeletal Disorders in Supermarket Cashiers**

by Colin Mackey  
Suffolk, UK: HSE Books  
(RC 925.5 M32 1998)

**Ergonomics Program Management Guidelines for Meatpacking Plants**

Washington, D.C.: U.S. Department of Labor  
(FS 1970 E73 1990)

### WORKPLACE HEALTH AND SAFETY PUBLICATIONS

#### Musculoskeletal Injuries

Parts 1 through 6

Alberta Injury Statistics and Costs (ERG017)

Symptoms and Types of Injuries (ERG018)

Biomechanical Risk Factors (ERG019)

Workplace Risk Factors (ERG020)

Assessing Ergonomic Hazards (ERG021)

Reducing Ergonomic Hazards (ERG022)

#### Order through

[www.gov.ab.ca/lab/facts/ohs/index.html](http://www.gov.ab.ca/lab/facts/ohs/index.html)  
or by phoning any of the WHS regional offices. (See page 2 for a list of offices.)

## Definitions

**Carpal tunnel syndrome:** damage to a nerve passing through the wrist to the fingers

**Trigger finger:** inflammation of tissues around the tendons of the finger that limits movement of that finger

## How employers can reduce MSIs on the assembly line

- Reduce time stress by relaxing deadlines and examining incentive programs that may contribute to workers' stress.
- Facilitate job rotation. Have workers do a variety of tasks requiring different actions.
- Ensure that equipment is designed for ease of operation. Take into account bending, reaching and twisting motions.
- Design tools for the workers. Consider workers' different sizes and body types.
- Adjust lighting and temperature to optimize comfort.
- Have workers take frequent breaks.
- Hire an ergonomic consultant to analyze the tasks workers are performing.
- Consult resource materials available through the Internet and Workplace Health and Safety.

## How an employee can reduce MSIs on the assembly line

- Be aware of the actions required to do a job.
- Identify steps that cause stress, and tell supervisors about them.
- Do stretches designed to alleviate stress resulting from a particular task.
- Maintain a reasonable degree of fitness.
- Take breaks as often as possible. Take time for lunch.



Injury is often the result of a mismatch between the demands of the work tasks and the worker's ability to meet those demands. A worker may be physically overloaded by the necessity of repeating one motion thousands of times during a shift.

Many companies see the value of adapting the workplace to the workers, recognizing that the best solutions for preventing MSIs come from the workers themselves. Companies are redesigning workstations and tools to reduce awkward repetitive motions. They are training workers to use the proper posture for the task, identifying repetitive stresses, rotating tasks so workers are not doing the same task all day and encouraging workers to take frequent breaks.

The Goodyear Tire assembly plant in Medicine Hat uses a training process called Objective Base Training (OBT) to ensure that its workers minimize the risk of MSIs. This process involves analyzing each task and categorizing it by phases of movement. Workers called "observers" at Goodyear go through the OBT with a trainer. They discuss what the job entails and how to do it safely. An accompanying OBT manual outlines specific key safety points that they both now and expect to address later.

Observers are certified within two to three weeks of starting. They now track and record their crew's job. As a result, they understand the essential job functions as well as the proper layout of safety warnings. By September, workers will be trained in ergonomic assessment and how to prevent injuries that are the result of stress.

"This OBT training process starts with chair height, monitor exposure at eye level, keyboard height, and the two-handed grip of having left and right hands on the keyboard," says Lyle Sherten, the health and safety manager at Goodyear Tire in Medicine Hat.

Both Goodyear and its suppliers recognized the importance of preventing MSIs on their assembly lines. Prevention programs like the ones these companies have implemented are meaningful steps toward ensuring the most common reason for MSIs.

"Muscle and joint work is, but they can't have a degradation (type) on their spine and their shoulder," says Ray's job safety engineering specialist at Workplace Health and Safety. "A worker in pain can't

concentrate. The quality and productivity of their work decreases. A worker with damaged nerves may become clumsy. Those things affect the company's bottom line, and they're taken home to the worker's family. MSIs are a serious problem."

*Lyle Sherten is a writer and columnist. She is a consultant who works from her home office in Calgary.*

#### WEB LINKS

[www.med.virginia.edu/medicine/clinical/orthopaedics/admus.html](http://www.med.virginia.edu/medicine/clinical/orthopaedics/admus.html)

Discusses various repetitive strain disorders.

[www.discoverhealth.com](http://www.discoverhealth.com)

Look up health topics. The site includes a desk rest on the day of your last occupational injury and illness.

[www.cdc.gov/niosh/93-101.html](http://www.cdc.gov/niosh/93-101.html)

Report the date for the upper extremity and wrist (UEWI) system design for design and development.

[www.ergoweb.com/](http://www.ergoweb.com/)

A collection of ergonomic information.

#### ERGONOMICS RECOMMENDATIONS FOR THE WORKPLACE

**Musculoskeletal Disorders in Supermarket Cashiers**

Source: Mackay, 1999  
Source: <http://www.ergoweb.com/>

**Ergonomics Program Management Guidelines for Meatpacking Plants**

Source: NIOSH, 1997. <http://www.cdc.gov/niosh/93-101.html>

#### ERGONOMICS RECOMMENDATIONS FOR THE WORKPLACE

**Musculoskeletal Injuries: Part 1 through 6**

Source: Bureau of Occupational Safety and Health, 1997. <http://www.osha-slc.gov/publications/MSI1.htm>

**Order through**

Occupational Safety and Health Administration, 2000. <http://www.osha-slc.gov/publications/MSI1.htm>

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# It's All Up In

## Hazards of Fabricated Wood Products

by Debbie Culbertson

**O**n a hot summer day in July, I am setting treated fence posts into the ground around our acreage. I wear thick gloves to protect my hands from the chemicals used to treat the wood. As I work, it strikes me that workers who prepare secondary forest products must take much stronger protective measures than weekend carpenters like me.

According to the Alberta Forest Products Association (AFPA), the manufacture of forest products accounts for 20,000 jobs in the province. Companies produce lumber, pulp and paper, panelboard – medium density fibreboard (MDF) and oriented strandboard (OSB) – and secondary manufactured products such as chemically treated wood products.

Henny Lamers is the manager of health, safety and environment at Rangerboard, a division of West Fraser Mills. The Whitecourt company produces 120 million square feet of medium density fibreboard (MDF) each year. The product is used in making kitchen counters, cabinets, furniture and flooring. To produce MDF, softwood fibres are put through a mechanical refining process.

"The fibres are refined using steam," says Lamers. "Urea-formaldehyde resin is added to the wood fibre, and it becomes a waxy dry mass." This mass is then formed into a mat and passed through a giant multi-opening press. The press is roughly 10 feet wide and 30 feet high. One worker operates the press from within an enclosed control room. Another worker spends about an hour a day cleaning the press. This is a demanding job. The press gets extremely hot during operation. Wood dust produced by the

refining process sometimes settles on the press and must be removed to avoid the risk of fire. An air hose is used to remove these excess fibres from the machine.

When the press opens intermittently to release pressure, formaldehyde vapour and fine wood fibre are released into the air. Formaldehyde produces a colourless, strong-smelling gas. At low concentrations it can cause watery eyes, nausea, coughing and chest tightness. Formaldehyde has caused cancer in laboratory animals and may cause cancer in humans.

### Chemical emissions and exposure

At Rangerboard, workers may use hand-held monitors to check the levels of formaldehyde gas in the plant. The company also regularly monitors air quality. Formaldehyde concentrations usually fall well below the permissible exposure limit of 2 ppm (parts per million). However, peak exposures above the 2 ppm limit do occur. When the hot formaldehyde vapour is released from the press, the exhaust stream flows upward. An employee who is cleaning the top of the press could be working right in the route taken by the stream. Lamers says that these workers must wear full-face cartridge respirators. "The mask has cartridges that filter out formaldehyde gas and wood dust," he explains.

Other forest product manufacturers face air quality challenges as well. Spray Lake Sawmills of Cochrane manufactures chemically treated wood products like my fence posts. According to safety and environmental coordinator, Howard Pruden, the company uses a "full cell pressurized treatment process." Plant staff use enclosed forklifts to load lumber onto carts. The carts are moved along

## How employers can lower the risks involved in the production of wood products:

- Implement strong industrial hygiene procedures, such as daily floor cleaning.
- Establish personal protection regimes (e.g., ensuring that glasses, gloves and protective clothing are worn at all times).
- Control exposure by rotating employees to different jobs.
- Provide mechanical safeguards such as ventilation and dust extraction systems.
- Monitor and maintain equipment.

## Protect yourself when working near dust or chemicals from wood products:

- Use a dust mask appropriate to the toxic substances being used.
- Change clothing frequently.
- Wear rubber gloves and protective eyeglasses.
- Wash hands after removing gloves and clothing.

# the Air



railway tracks into a long, pressurized cylinder. The cylinder doors are closed and a vacuum is introduced into the chamber. Then it is flooded with a chemical solution made up of 98 per cent water and 2 per cent chromated copper arsenate (a mixture of arsenic, hexavalent chromium and copper). The cylinder is pressurized for two to three hours. The solution is drained off, to be reused later.

Like the workers at Rangerboard, Spray Lake staff must guard against short-term peak exposures to toxic substances. For instance, when the treatment cylinders are opened, residue left from the treatment process is dispersed into the air. It eventually accumulates on the floor. If this residue isn't removed, it can be stirred up into the air whenever equipment or staff move about on the plant floor.

At Spray Lake, workers keep the residue under control by washing the floor of the treatment plant every day with a high-pressure hose. There's only one other time that they come into direct contact with the treated products: when they unchain the wood for transport after it has been released from the cylinder. Fortunately, a personal protection regime is in place to limit exposure in these situations.

"The staff wear rubber gloves and glasses, and they change their coveralls frequently," says Pruden. "We do air monitoring once a year and biological sampling of staff to see if they're being affected. We also rotate staff to other functions."

## Controlling exposure to wood dust

Pruden says that keeping airborne dust to a minimum is also important in the largest part of Spray Lake's operation — its sawmill. Exposure to wood dust occurs at all stages of wood processing. According to Workplace Health and Safety, many types of wood contain chemicals that can irritate the eyes, nose and throat. Workers exposed to some softwood dusts are also at risk of developing reduced lung function and dermatitis (an inflammation of the skin).

Spray Lake uses a vacuum system to minimize airborne dust in the sawmill. It works like the central vacuums used in homes. A long tube is placed near the cutting saw. This tube is attached to a central fan mechanism that generates suction. As lumber passes through the blades, fine airborne dust is drawn into the tube. Heavier sawdust drops beneath the

blades onto conveyor belts. Later, the heavy sawdust is combined with the finer material and is bagged and sold to other manufacturers.

Spray Lake has invested \$220,000 into their vacuum system. While the company doesn't benefit financially from the equipment, Pruden says that Spray Lake managers believe that "the biggest return is the health of our employees."

A recent study by the National Institute for Occupational Safety and Health (NIOSH) indicates that North American wood treatment plants have a good health and safety record. As I finish my fencing job, it's good to know that these manufacturers likely haven't left safety up in the air.

*Debbie Culbertson is a writer and editor living in Devon, Alberta.*

## Resources

### WEB LINKS

[www.ohsu.edu/croet/links.html](http://www.ohsu.edu/croet/links.html)

CROET (Center for Research on Occupational and Environmental Toxicology) provides links to a variety of hazards related to wood products and pulp and paper safety.

[www.cdc.gov/niosh/nasd/docs2/as13200.html](http://www.cdc.gov/niosh/nasd/docs2/as13200.html)  
Occupational Safety and Health Administration's (OSHA's) exposure standard for wood dust.

by Diane Radnoff

**A**pproximately 90 per cent of the work sites in Alberta are governed by the Alberta Occupational Health and Safety Act and its regulations. The remaining 10 per cent fall under the jurisdiction of federal laws, namely the Canada Labour Code, Part II, and the Canada Occupational Safety and Health Regulations. Understandably, there is often some confusion about which industries in the province come under which legislation.

**Three key questions need to be answered in determining the jurisdiction of a particular operation:**

1. Does the purpose of the business involve moving people, goods or communication beyond provincial or international borders (for example, busing, trucking or television)?
2. Has the business been deemed to be for the "general advantage of Canada" (for example, the grain business)?
3. Is the worker governed by federal or provincial legislation?

The third question is usually the most difficult. For example, construction as an industry falls under provincial jurisdiction, but what happens when a provincial construction company is contracted to build a grain elevator? During the construction phase, the construction workers are still under provincial jurisdiction. But after construction is complete, the employees of the grain company who move in fall under federal jurisdiction, since grain elevators are regulated federally, and thus the employees of the grain elevator will be regulated federally.

If a provincial construction company is hired to come on site to do renovations or other work once the elevator is operating, these construction workers are still regulated provincially. However, the construction company also needs to comply with

federal legislation that governs the work site.

As a general rule, if you're working for a company that is provincially regulated on a site that is federally regulated, you should comply with the more stringent legislation – especially if you're unsure about which legislation applies.

Keep in mind that provincially and federally "incorporated" does not mean the same thing as federally or provincially "regulated." For example, department stores such as the Bay or Sears are federally incorporated, but they are regulated by provincial legislation because they carry and sell their own merchandise (i.e. are not "common carriers").

For more information or to verify jurisdiction, contact one of the Workplace, Health and Safety regional

offices (listed on page 2) or Human Resources Development Canada.

*Diane Radnoff is a senior occupational hygienist and provincial WHMIS coordinator with Workplace Health and Safety.*

## Resources

### WEB LINKS

[www.cupe.ca/doc/990209-1.html](http://www.cupe.ca/doc/990209-1.html)

Concerns about change in jurisdiction for safety from federal to provincial regulations for a mine

[www.ccohs.ca/oshanswers/information/govt.html#\\_1\\_1](http://www.ccohs.ca/oshanswers/information/govt.html#_1_1)

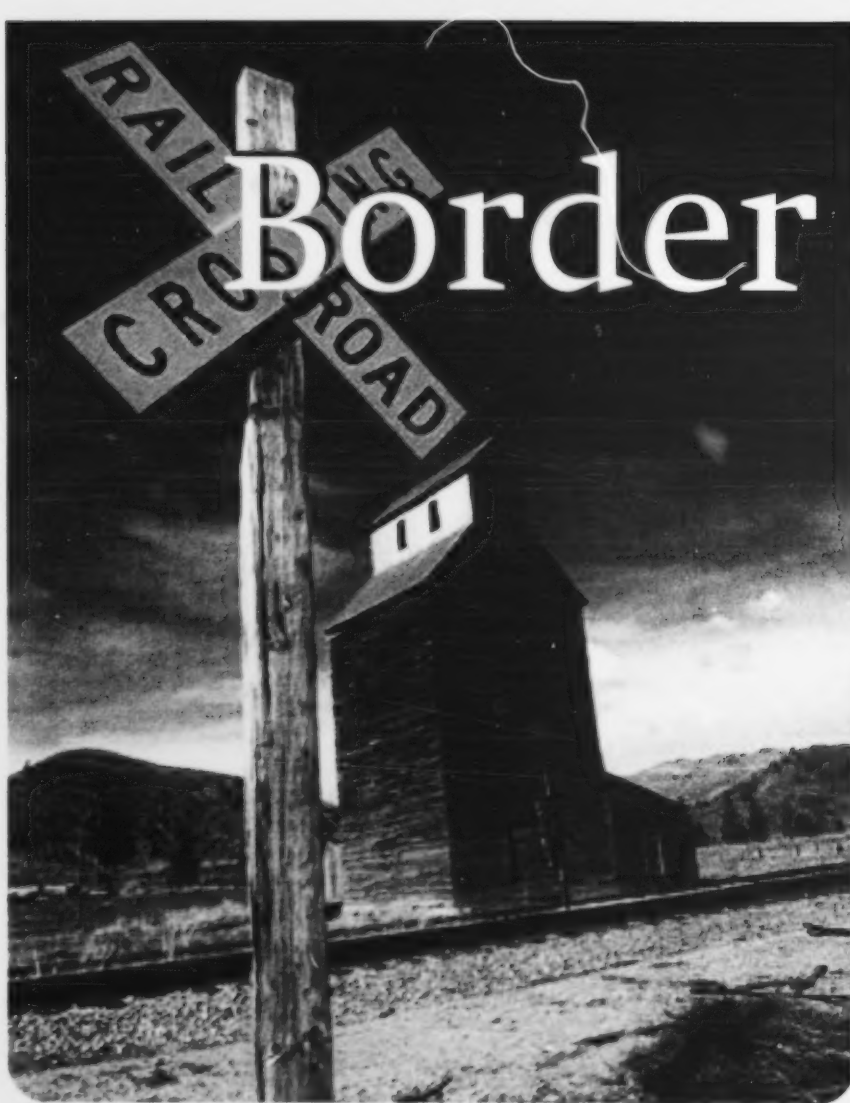
List of federal and provincial departments responsible for occupational health and safety.

[www.ccohs.ca/oshanswers/legisl/intro.html](http://www.ccohs.ca/oshanswers/legisl/intro.html)

An article from CCOHS about who does what in terms of OH&S legislation in Canada.

[info.load-otea.hrdc.drhc.gc.ca/~legweb/homeen.shtml](http://info.load-otea.hrdc.drhc.gc.ca/~legweb/homeen.shtml)

Legislation that falls under federal jurisdiction.



# Crossings

The following table provides some guidelines to the regulatory jurisdiction of federal and provincial industries in Alberta.

Federal Jurisdiction	Provincial Jurisdiction
Federal public service and Government of Canada crown corporations (e.g., HRDC, Canada Post, CMHC)	Provincial public service and provincial crown corporations
A railway, canal, telegraph or other work or undertaking that connects one province with another or extends beyond the limits of one province	
Railroads that cross provincial boundaries (e.g., CN, CP Rail)	Short-haul railroads that operate within the province (e.g., ProCar, PDS Railcar Service, Central Western Railway, Stettler Short Line)
Road transport: interprovincial trucking companies (carriers that transport other people's goods) and their facilities (warehouse, maintenance garages) <ul style="list-style-type: none"> <li>This category includes buses, couriers, moving companies and oil-field haulers that are common carriers or do interprovincial trucking (e.g., Canadian Freightways, Tri-Line, Jo-Ann Trucking).</li> </ul>	Road transport: companies that transport their own products, even if they cross provincial borders (e.g., Safeway, Sears, The Brick)
Buses and couriers (e.g., Greyhound, Brewsters, UPS, Purolator)	Buses and couriers (e.g., school buses, city buses, local couriers, bicycle couriers)
Aeronautics: passenger or cargo airlines, aircraft maintenance companies, most airside operations such as baggage handlers and refuelers, security services for pre-board screening and air traffic control <ul style="list-style-type: none"> <li>If carrying passengers or freight is an integral part of the airline operation, it is regulated federally (e.g., Hudson General, PLH Aviation Services, NavCan).</li> </ul>	Aircraft component manufacturers, retail shops and restaurants located at an airport (e.g., Sky Chefs, Canadian Turbine, United Technologies)
Oil and gas pipelines that pass over provincial or international borders (administered by the National Energy Board), including pipeline head offices and compressor stations, and offshore drilling and production if they fall within an aspect of shipping in Canadian waters	Pipeline construction and maintenance (e.g., construction workers building the pipeline — since "jurisdiction follows the worker")
All grain elevators and most feed mills, flour mills, feed warehouses and seed cleaning mills (e.g., Martin Pet Foods, Landmark Feeds, Masterfeeds, Cargill feed mills, Agricare elevators)	Retail services or storage of grain/feed for sale that is separate from the elevator operations (e.g., Cargill meat processing, Agricare fertilizer operations)
All chartered banks (e.g., Bank of Canada, Bank of Hong Kong)	All trust companies and credit unions (e.g., Canada Trust, Alberta Treasury Branches, Calgary First)
Telecommunications: telephone companies and most national paging companies (e.g., Telus, AT&T)	Telecommunications: companies selling cellular phones (e.g., TAC Mobility)
Broadcasting jurisdiction determined with respect to hertzian waves (e.g., Shaw, City Cable, WIC Communications)	Production companies that film videos but do not show/broadcast them
First Nations: band employees and industries that benefit the band	First Nations: industries that do not benefit the band (e.g., a company that is operated for the benefit of an individual such as a retail gas station)
Uranium mining	All other types of mining



## Workplace Health and Safety, Alberta Human Resources and Employment

Workplace Health and Safety produces publications on a variety of occupational health and safety subjects. Publications come as manuals, brochures, booklets, bulletins, posters and stickers, and are regularly reviewed and updated.

## New Publications

## First Aid Regulation – Questions and Answers (FA007)

- Answers to frequently asked questions about the new *First Aid Regulation*.

## An Explanation of the First Aid Regulation (FA008)

- A plain language explanation of the requirements of the new *First Aid Regulation*. Includes the complete text of the regulation.

## Fatigue and Safety at the Workplace – Quick Facts (ERG015.1)

- A single-page summary of workplace safety issues involving fatigue.

## Noise in the Workplace (HS003)

- How to control workplace noise through a hearing conservation program.

## Proper Height of Work Surfaces (ERG016)

- Advice on proper work surface heights.

## Operation of Scott II and IIA Self-Contained Breathing Apparatus in Negative Pressure Mode (BA001)

- Advice to employers and workers on the safe use of this equipment.

## Death of a Worker Due to Off-Gassing of Isobutane Foam Packing Material (CH057)

- Recommendations to the trucking industry after an explosion involving isobutane.

## Worker Killed While Servicing Truck Tire (AL019)

- Recommendations to the trucking and tire servicing industries on the safe servicing of truck tires.

## Selecting Hand Tools (ERG023)

- Suggestions for selecting hand tools that work well and fit the worker.

## Revised Publications

## A Welder's Guide to the Hazards of Welding Gases and Fumes (CH032)

- Summarizes the dangerous gases and fumes that welders are exposed to. Includes information on how welders can protect themselves against these hazards. Also available as a pocket booklet.

## Safe Work Permits (SH013)

- Discussion of work permits that authorize dangerous or unusual work: what they are and how to use them.

## Guideline for Occupational Health Services (HS002)

- Reprint of the International Labour Organization's recommendations for the components of a quality occupational health services program.

## The Hazards of Floor Openings (SH012)

- Summary of requirements and safe work practices for safeguarding hazardous floor openings at work sites.

## Appropriate Workwear for Flash Fire and Explosion Hazards (PPE005)

- Review of the hazards of flash fires and clothing recommendations for protection of workers.

## Guideline for the Development of a Code of Practice for Respiratory Equipment (PPE004)

- Practical advice and guidance for those having to prepare a code of practice.

## Anti-Fatigue Matting (ERG005)

- How matting can be used to prevent soreness and fatigue, including tips on selecting matting.

## Don't Strain Yourself (PH001)

- Handy tips for avoiding sprains and strains when lifting and handling materials. Also available as a pocket book.

## Joint Work Site Health and Safety Committee Handbook (LI004)

- How to make a work site health and safety committee work effectively.

Currently over 160 publications can be ordered through Workplace Health and Safety (WHS), at [www.gov.ab.ca/lab/facts/ohs/index.html](http://www.gov.ab.ca/lab/facts/ohs/index.html), or by phoning any of the WHS regional offices (see page 2 for a list of offices). The majority of publications are free of charge; charges may apply to bulk orders of 20 or more.

## Canada Labour Code

One-day information sessions on the *Canada Labour Code Part II* and the *Canada Occupational Safety and Health Regulations* from Human Resources Development Canada – Labour Branch.

October 3	Grande Prairie
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October 5	Lloydminster
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October 12	Edmonton
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October 13	Edmonton
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October 17	Calgary
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October 18	Lethbridge
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For more information, or to register, contact Gail:

✉ [gail.edwards@hrdc-drhc.gc.ca](mailto:gail.edwards@hrdc-drhc.gc.ca)

☎ (403) 292-4678 (refer to the Safety Consultants' Course)

## Focus on Zero Injuries

Hazard Alert Training's fall training calendar includes the following workshops:

ZERO Injuries – Best Practices

ZERO Injuries – Risk Assessment

ZERO Injuries – Behavioural Safety

OH&S Due Diligence

Contractor Due Diligence

For more information, contact:

**Hazard Alert Training**

☎ (780) 466-6960

toll-free: 1-800-561-2319

🌐 [www.hatscan.com](http://www.hatscan.com)

## Web Watcher



by Bob Christie

# Are You a Sophisticated Surfer?

Using only one of the many search engines on the Web, you can enter "musculoskeletal injuries" and come up with close to 9,000 pages. Ask for "ergonomics" and you find more than 61,000 pages. A more specialized search for something like RSI (repetitive strain injury) yields a mere 28,000 references. It seems like almost everybody has something to say about what was at one time a pretty specialized discipline.

Many of these sites are quite useful, while others are questionable.

The key is to become a sophisticated surfer. Far too many people think, "If it is on the Web, it must be accurate." In its formative days, television was also granted a great deal more credibility than it deserved. "I saw it on television!" was a common rationale for accepting some of the most outrageous claims imaginable. These days, most visually literate viewers take the claims on television with a large grain of salt.

So how do you tell a good Web site from a likely scam? Simply look at the credibility of the content. At the end of the day, remember that if it seems too good to be true, it probably is.

Some say, "Don't trust the dot com sites but the edus, nets, orgs and gov's are all fine." Don't believe it. It is possible to get almost any suffix, simply for the asking. Many unscrupulous people deliberately use such techniques to mislead.

Others tend to think that a lot of hits from the search engine adds credibility. Give me two days and I can put up 200 sites for the same product, all from different addresses. And every one of them will be coming off the same connection, the same domain and the same computer.

There is a lot of good stuff on the Web. But you have to be careful.

Bob Christie is a partner at Christie Communications Ltd., a multimedia development company in Edmonton.

## The Last Resort



# reporting on recent successful prosecutions

under the *Occupational Health and Safety Act*

### Employer

Sahara Sandblasting and Painting Ltd. of Edmonton, Alberta

### Incident

On April 28, 1998, a temporary worker from Active Personnel Services, 39-year-old Robert Schaff, was fatally injured while he was working for Sahara Sandblasting and Painting Ltd. Mr. Schaff was helping a mobile crane operator move a 5.67-tonne heat exchanger vessel from a hi-boy trailer (a high, flat-deck trailer used for hauling heavy equipment or material that can be loaded with a crane or forklift). The crane was to carry the vessel to an area for sandblasting and painting. As the crane operator attempted a 90-degree turn, the crane tipped over and the crane's boom fell onto Mr. Schaff, killing him.

### Violation

Sahara Sandblasting and Painting Ltd. was charged with five counts of violating the *Occupational Health and Safety Act* and *General Safety Regulation*. The company pleaded guilty to one charge under the Act for failing to ensure the health and safety of the worker.

The investigation determined that Sahara Sandblasting and Painting Ltd.:

- failed to ensure the health and safety of all workers engaged in the employer's work
- failed to ensure that the work was being performed by competent workers or by workers being directly supervised by a competent worker
- failed to ensure that the crane was operated, used, handled, serviced, maintained and repaired in accordance with the manufacturer's specifications
- failed to ensure that a competent worker was designated as the operator of the hoist (crane) and to ensure its safe operation
- failed to address the danger created by the movement of the load being raised and moved, and also failed to provide a tag line (a line or rope tied to a crane load that allows a worker to direct the load but keep enough distance to avoid contact if it falls)

### Penalty

\$45,000

Full investigation reports are available from the Alberta Human Resources and Employment Library, (780) 427-8533.



In the real world, identifying and resolving ergonomic issues requires awareness, knowledge and a willingness to try new things. Real World Solutions is a regular column that suggests simple, inexpensive ways to improve employee health through adjustments to the workplace.

If you've found a solution that you would like to share with our readers, please send it to [ray.cislo@gov.ab.ca](mailto:ray.cislo@gov.ab.ca). We will publish those that apply to a broad range of situations.

## Choosing the Correct Hand Tool



### The Problem

Using the wrong hand tool for long hours can lead to hand, wrist, and arm fatigue and pain.

### The Solution

Select the tool with the grip or handle that matches the orientation and height of the workpiece. Many tools are available in models with either in-line or pistol grip handles.



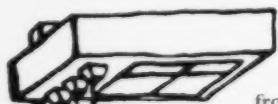
### Benefits

- Avoids awkward arm positions, reducing muscular fatigue and potential for hand, wrist, and arm injury.
- The tool can be used with greater control and less force, improving quality and productivity.

## Suspending Hand Tools

### The Problem

Constant reaching, lifting, supporting and lowering portable hand tools. Highly repetitive tasks can lead to overuse injuries.



### The Solution

Use hanging tools for operations repeated at the same workstation. Many tools can be suspended from pulleys, counterweights or wire spring coils.

### Benefits

- Hanging tools are always within reach, and lifting and lowering motions are eliminated.
- Some of the tool's weight is always supported, reducing worker fatigue.
- Less storage space is needed and worker productivity may improve.

# Give Me

## A Look at Hand Tool Design

by Ray Cislo

**A**re your hand tools too heavy or poorly balanced? Is the grip too large, the wrong shape or slippery?

Poorly designed hand tools can lead to injuries of the hand, wrist, forearm, shoulder and neck. Choose hand tools that save wear and tear on your body.

For example, hammers or pliers with bent handles keep the wrist and forearm straight, thus reducing injuries and increasing power. Pliers and cutting tools with spring-assisted jaws require less finger and hand effort to repeatedly open the jaws. And power tools with foam or rubberized grips help reduce the transfer of vibration to the hands and arms.

### Grip

A well-balanced tool with a properly designed grip or handle instantly feels comfortable in the hand. If a tool is poorly designed or is not right for the job, you may have to hold it more firmly and at an awkward angle. A properly designed grip helps to reduce fatigue and pain. Consider whether the job requires a tool with a pistol grip or an in-line grip. When you have to deliver a lot of power or torque, select tools that allow a power grip. With this grip, the hand makes a fist with four fingers on one side and the thumb on the other, similar to holding the pistol grip of a power drill.

Tools that can be used in either hand allow you to alternate hands. They also enable the 10 per cent of workers who are left-handed to use them properly.



### Handle size

The right-sized handle allows your hand to go more than halfway around the handle without the thumb and fingers meeting. The recommended grip diameter in most cases falls between 50 and 60 mm. To provide good control of the tool and prevent pain and pressure hot spots in the palm of the hand, handles should be at least 120 mm long.

A precision grip (when the tool is pinched between the tips of the thumb and fingers) is primarily used for work that requires control rather than a lot of force. The handles for precision tools should be 8 to 13 mm in diameter and at least 100 mm long.

### Grip surfaces

The grip surfaces of hand tools should be smooth, non-conductive and slightly compressible to dampen vibration and better distribute hand pressure. Avoid tools that have grooves for your fingers — for most people the grooves are either too big or too widely or closely spaced. The resulting pressure ridges across the hand can damage nerves or create hot spots of pain. Grooves along the length of the handle are intended to prevent

**Poorly designed hand tools can lead to injuries of the hand, wrist, forearm, shoulder and neck. Choose hand tools that save wear and tear on your body.**

slipping but can also cut into the hand and create pressure ridges, particularly if the tool is in continuous use. If a grooved handle is your only choice, make sure that the grooves are many, narrow and shallow. If it's available, try a grip shape that's non-cylindrical. Triangular grips measuring approximately 110 mm around at their widest part can be quite comfortable and help increase power.

### Weight

Weight is often a problem with power tools and tools such as axes, hammers and saws. To reduce hand, arm and shoulder fatigue, the hand tool shouldn't weigh more than 2.3 kg. If the centre of gravity of a heavy tool is far from the wrist, this maximum weight should be reduced. Studies

have shown that tools weighing 0.9 to 1.75 kg feel "just right" for most workers. For precision work where the small muscles of the hand support the tool, it should weigh far less. Lighter is better. Heavy tools can be made easier to use by suspending or counter-weighting them.

### Triggers

Many power tools have a trigger that is operated either by the thumb or one or more fingers. To avoid hand and forearm fatigue, look for tools that can be activated by either hand. Also, the trigger should have a mechanism that holds or locks it in place while the tool is being used. Triggers should be at least 25 mm long for single-finger activation and 50 mm long for two-finger activation. Use four-finger activation only with suspended tools.

### A cautionary note . . .

No tools are specifically defined as "ergonomic." If the tool fits, it's the right one for the worker and the job.

*Ray Cislo, P.Eng., B.Sc. (H.K.), is a safety engineering specialist at Workplace Health and Safety.*



Alberta Human Resources & Employment Library

## Recent Acquisitions

### Human Resources Guide to Preventing Workplace Violence

by Keith Norman

Aurora, Ontario: Aurora Professional Press, 1999

(HF 5549.5 E43 K44 1999)

- This book not only presents the problem and defines workplace violence, but also provides a number of responses and solutions.

### Guide to Accident Prevention

Calgary, Alberta: Newpark Canada Inc., 1999

(T55 N3 G84 1999)

- This booklet presents an overview of Newpark's total safety program.

### Lead: Preventing Exposure at Work

Richmond, B.C.: Workers' Compensation Board of British Columbia, 1999

(RA 1231 L4 L42 1999)

- This booklet discusses inorganic lead exposure in the workplace.

### Managing for World Class Safety: Report on Research on the Management of Safety

by J. M. Stewart Enterprises

Toronto, Ontario: The Rotman School of Management, University of Toronto, 1999

(HD 7262 S73 1999)

- The objective of the safety management research was to investigate in depth a few companies with enduring world-class safety performance and try to define, in a more quantitative way than had been previously done, how they achieve excellence.

## Library news

To borrow materials, please contact your local library and request materials through the inter-library loan process.

The library is now linked electronically to 25 university, college, health and government libraries across Alberta. You can search the library catalogue over the Web through [gate.library.ualberta.ca](http://gate.library.ualberta.ca). The Alberta Human Resources and Employment library location code is AB HR & Employment.

## Alberta Human Resources & Employment Library

3rd Floor, 10808 - 99 Avenue

Edmonton, Alberta T5K 0G5

(780) 427-8533

toll-free connection 310-0000

(780) 422-0084

[www.gov.ab.ca/lab/facts/av](http://www.gov.ab.ca/lab/facts/av)



## National Health & Safety Conference in Calgary

**October 24th - 27, 2000**

Calgary, Alberta

The CSSE (Canadian Society of Safety Engineering) – Alberta hosts the Opportunities and Solutions for a New Century conference, featuring national, international and provincial speakers. For more conference information, see [www.csse.org](http://www.csse.org).

## Best Practices in Ergonomics Conference

**October 24, 2000**

Calgary, Alberta

In conjunction with the CSSE's national conference, the Workers' Compensation Board – Alberta and CSSE showcase leading-edge ergonomic best practices in the industrial and office environments.

For information and a registration form:

[www.wcb.ab.ca/html/ergoconf.html](http://www.wcb.ab.ca/html/ergoconf.html)

(780) 498-8650

## Safe Communities — It's Everyone's Responsibility

**October 26 - 27 2000**

Peterborough, Ontario

A two-day conference for anyone who wants to make communities safer places to live, learn, work and play. Download the conference registration brochure from [www.safecommunities.ca](http://www.safecommunities.ca).

For more information contact:

Safe Communities Foundation

(416) 964-0008

## Municipal Safety-Utility Workshop and Trade Show

**December 5 - 7, 2000**

Red Deer, Alberta

Topics cover health and safety issues and regulation changes, deregulation of the power industry in Alberta, and managing and motivating employees in health and safety.

For more information, contact:

Al Coker

(403) 347-0324

Keith Bobey

(780) 968-8448



Occupational Health & Safety Magazine publishes Workplace Fatalities to remind readers of the importance of workplace health and safety. The information is not a final investigation report. In many cases the investigations are continuing.

An occupational fatality refers to the death of a worker caused by a work-related incident or exposure.

To protect personal privacy, the fatality descriptions do not include the names of the victims.

### Work-related incident fatalities March - June 2000

Most work-related incident fatalities that fall under provincial jurisdiction are investigated by Workplace Health and Safety. In general, highway traffic, farm, disease or heart attack fatalities are not investigated.

The following fatalities have been or are being investigated.

**A 58-year-old communications tower worker** had completed final adjustments to the antenna of a radio communication tower at an oil and gas battery site. While climbing down from the tower, approximately 22 metres above ground, he slipped and fell to his death. Although he was wearing appropriate fall protection equipment, he had nowhere to attach his fall arrest tether as he climbed down.

**A 32-year-old concrete construction worker** was cutting a steel plate outside the company's main shop with an oxyacetylene torch. The flame from the torch penetrated the barrel of asphalt primer the worker was using as a table, causing an explosion and fire. The worker died from his injuries.

**The 32-year-old operations manager** of a ski hill area had climbed up onto the bullwheel that drives the T-bar lift to repair a broken T-bar. The man made the repairs while standing on top of the bullwheel, 5.5 metres off the ground. As he was about to climb down, the lift started up. He slipped and fell between the bars of the bullwheel, striking his head on the bars. He died from his injuries.

**A 60-year-old painter** was standing on a manufactured rolling scaffold platform while spray painting the ceiling of a store. He was fatally injured when he fell 2.5 metres off the platform, striking the concrete floor.

**A 36-year-old instructor of motorcycle mechanics** was killed while operating a motorcycle in a parking lot without wearing a helmet. The motorcycle hit a patch of gravel and overturned.

**A 28-year-old yardman** was attempting to boost a yard truck parked behind an entrance gate. The yardman attached a battery-charging pack to the truck battery with booster cables. While standing outside the driver's side of the cab, the yardman reached inside and started the truck. The truck moved forward and crushed the man between the side of the truck and a gatepost. The worker was crushed.

**A 31-year-old materials handler** was using a forklift to move pallets of merchandise from an upper loading dock to an area behind a tractor-trailer parked inside the loading dock building. After relocating the pallets behind the tractor-trailer, the worker parked the forklift near the corner of the tractor-trailer. He was standing between the forklift and the tractor-trailer when the forklift rolled and pinned him against the corner of the trailer. The worker was crushed.

**A 41-year-old worker-foreman** was using an angle-grinder to grind slag from a cast-iron counterweight for a forklift. During the grinding process, the grinder disc fractured. A piece of disc penetrated the foreman's face shield and struck him on his head. The foreman sustained fatal injuries.

### Occupational disease fatalities accepted February - June 2000

Disease fatalities represent claims that have been accepted by the Workers' Compensation Board (WCB) - Alberta for compensation. They are counted in the year they are accepted.

The following fatalities resulted from exposure to asbestos, grain or wood dust.

Claims were accepted for:

**A 60-year-old insulator and roofer**, who worked with spray insulation and used asbestos to insulate pipes.

**A 69-year-old labourer**, who sprayed limpet (asbestos in its purest form) on ceilings and used asbestos to insulate pipes. The man was also exposed to moderate amounts of coal dust.

**A 78-year-old plumber, pipefitter and steamfitter**, who was exposed for over 17 years to asbestos, chemical plastics, asbestos-wrapped pipe and lined boilers.

**A 67-year-old carpenter**, who was exposed to asbestos dust for five years while constructing trailers in a fabrication shop insulated with asbestos. He also cut and installed asbestos sheeting behind stoves and furnaces.

**A 75-year-old lineman and cable splicer**, who was exposed to asbestos over 14 years of working with asbestos tape used to wrap lead cables at transformer installations.

**A 57-year-old millwright**, who worked with spray-on asbestos insulation, asbestos gaskets and seals. He was exposed mainly when he worked on turbines.

**A 52-year-old painter**, who worked closely with insulators, pipefitters and boilermakers. He also painted asbestos pipe insulation and asbestos mud.

**A 63-year-old sheet metal worker**, who was exposed to asbestos dust for about 18 years. His work included applying sheet-metal casing over ducts sprayed with asbestos.

**A 79-year-old elevator agent**, who was exposed to grain dust for approximately 30 years and wood dust for about 11 years.

**A 62-year-old plumber**, who was exposed to asbestos cement, gaskets, valve packing, pipe covering, rope and spray-on fireproofing in the 10 years he worked in new building construction.

**A 67-year-old pipelayer**, who was exposed to asbestos for over 20 years by sawing water and sewer pipe, and machining the ends of the pipe. The man also worked for three years in a sawmill, where he was exposed to wood dust.

# CHECK THE SIGNS!

## WATCH FOR THESE WHMIS HAZARD SYMBOLS



**CLASS A**  
Compressed  
Gas



**CLASS D-2**  
Poisonous and  
Infectious Material  
(Materials Causing  
Other Toxic Effects)



**CLASS B**  
Flammable and  
Combustible  
Material



**CLASS D-3**  
Poisonous and  
Infectious Material  
(Biohazardous  
Infectious Materials)



**CLASS C**  
Oxidizing  
Material



**CLASS E**  
Corrosive  
Material



**CLASS D-1**  
Poisonous and  
Infectious Material  
(Material Causing  
Immediate and  
Serious Effects)



**CLASS F**  
Dangerously  
Reactive Material

**\* WHMIS provides information  
on the safe use of hazardous  
materials at Canadian workplaces.**

\* Workplace Hazardous Materials Information System

A public service message  
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Health & Safety Magazine



